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Factors Conditioning Tuberculin Type of Hypersensitiveness.—Three series of experiments are reported. The first has to do with the influence of a previously produced anaphylactic sensitivity on the development of tuberculin-type sensitivity to egg-white; the second the effect of small and subminimal doses of egg-white in producing a tuberculin type of sensitivity in single and in repeated injections; and the third, the effect of the sensitization of guinea pigs after an intravenous infection with tubercle bacilli, since in all laboratory tuberculous infections some degree of generalization of the process must occur. *Results: Series 1:* Preliminary treatment with egg-white of a series of animals, thus producing an anaphylactic sensitiveness before infection with tubercle bacilli and subsequent treatment with egg-white to produce a tuberculin type of reaction to egg-white, apparently prevented in the majority of instances the development of tuberculin-type sensitivity. *Series 2:* An initial injection of a much smaller amount of egg-white than the minimal dose exerts a marked influence on the effect of injections given at later periods. When successive doses are used in sensitizing the animals, or when repeated skin tests are made, either the anaphylactic or tuberculin type of sensitivity may develop. Among the factors governing which type of sensitiveness will appear are the intervals between injections, the route of injection not only of the initial but of subsequent doses and the condition of the animal dependent on the state and degree of its infection. Repeated injections at short intervals favor the development of the anaphylactic type of sensitivity. If the interval after the first injection is long enough for the development of a marked grade of tuberculin-type sensitivity, consecutive injections usually increase the strength of this type of sensitivity. *Series 3:* During the first week after intravenous infection with the R1 strain of tubercle bacilli conditions as favorable for the tuberculin type of sensitiveness as those afforded by a strong local infection are not produced. If the intravenous infection is a heavy one the effect appears in contrast to be distinctly inhibitory. It seems fair to conclude that the slight generalized infection which follows a local tuberculous infection has little to do with the effects observed in locally infected guinea pigs. The observation that the presence of an anaphylactic type of sensitivity inhibits the development of a tuberculin type of sensitivity corresponds well with the conception that the tuberculin type of sensitivity represents the early stage and the anaphylactic type the late stage in the development of the sensitization process. The tuberculin type of hypersensitivity (skin) is ordinarily produced by injecting an

area of localized tuberculosis (node) with the sensitizing antigen (egg-white). In series 3, however, the guinea pigs were injected intravenously with the egg-white.—*Factors Conditioning the Development of the Tuberculin Type of Hypersensitivity, L. Dienes, J. Immunol., July, 1932, xxiii, 11.* (*J. S. W.*)

Reactions to Extracts from Tubercle Bacilli.—The experiments reported involve the study of meningitis produced in rabbits by the introduction of living and killed tubercle bacilli into the subarachnoid space, as compared with the effects of the injection of various extracts from the tubercle bacillus. Every extract tested produced some symptomatic or pathological change. The tests were made in both tuberculous and normal rabbits. The tubercle bacilli used were bovine strain B1. The heat-killed organisms were prepared by immersing a suspension of B1 in a water-bath at 70°C for 1 hour. Organisms were also killed by immersion in 0.4 per cent formalin for 10 days at 37°C. The formalin was then removed by centrifugation and washing. The lipoid used was the phosphatide, A-3, from bovine tubercle bacilli. The tuberculoprotein (MA-100) employed was prepared from cultures of human tubercle bacilli. Fresh tissue from the dura, pia and brain was examined immediately after removal at autopsy, using supravital staining. The entire brain and upper portion of the spinal cord were fixed and sectioned. The introduction of 500,000 living tubercle bacilli into the subarachnoid space of rabbits readily produced tuberculous meningitis. The predominant cell in fresh preparations of the pia at first was one with large vacuoles of equal size and uniform staining reaction with vital neutral-red. The same type of cell appeared after the injection of dead bacilli and tuberculophosphatide. It is clearly a cell which has engorged itself with a great amount of one type of material, and the vacuoles appear to contain a lipoid, since some of the cells show myelin-like figures, which is characteristic of the phosphatide. That it is a phenomenon of phagocytosis and not of cellular degeneration is shown by the fact that the cells are alive and active; and that the vacuoles slowly lessen in size, while at the same time their number increases until the cell corresponds to the epithelioid cell with coarse vacuoles. The authors believe this cell to be a young connective-tissue cell, possibly less differentiated than the monocyte, which has been stimulated to marked phagocytosis of a lipoid. They have designated it the meningeal first-stage epithelial cell. After the third day lymphocytes and plasma cells began to increase in number and soon became the most numerous cells in the meninges. Heat-killed organisms produced lesions similar to those obtained with living organisms, but with a greatly delayed period of reaction, over two months. The possibility that a few organisms may have remained alive after the heating must not be overlooked. The immediate reaction was the cell with even-sized vacuoles staining uniformly with neutral-red. The group receiving formalin-killed bacilli was too small to warrant conclusions. Such bacilli apparently produced lesions similar to those obtained with living organisms. With the intrameningeal injection of tuberculophosphatide the response was more pronounced than after the introduction of living and heat-killed bacilli. The vacuolated preëpithelioid cells remained unchanged at the end of one month, but finally the vacuoles of the cells diminished in size until they were the size found in the coarse-vacuole epithelioid cell, and corresponded exactly to the type observed in the terminal stages after the introduction of living bacilli. Intrathecal injections of tuberculoprotein produced a characteristic rise in temperature in normal and tuberculous rabbits. The temperature reaction is more pronounced in tuberculous rabbits than in normal ones, though the difference is quantitative and of small degree. The predominant cells in the cerebrospinal fluid and meninges after tuberculoprotein, MA-100, were lymphocytes and plasma cells. A few clasmatocytes and an occasional polymorphonuclear leucocyte were seen in fresh preparations. None of the meningeal epithelioid cells with coarse vacuoles, such as are seen after the introduction of the phosphatide and bovine tubercle bacilli, were observed. Histological examination showed only a slight quantitative difference between the cellular response in sensitive and nonsensitive animals. Nowhere was there found a fulminating necrotic reaction, such as one would expect if the meninges were extremely hypersensitive. Both normal and tuberculous rabbits may fail to give a temperature response to a given dose of tuberculoprotein after repeated intrameningeal doses of the same size. However, an increase in the size of the dose elicits a temperature response similar to that of the first injection. The results suggest that the number of injected organisms plays a greater rôle in tuberculous meningitis than the phenomenon of sensitization.—*Cellular Reactions in the Meninges of Rabbits to Tuberculo-Lipoid, Protein and Polysaccharide, Compared with the Effects of Tubercle Bacilli, J. V. A. Bickford, J. Exper. Med., July 1, 1932, lvi, 39.*—(*J. S. W.*)

Preparation and Purification of Tuberculin.—To obtain the active substances of tuberculin the authors used Willstätters adsorption method and Sauton's medium. The "Sauton tuberculin" showed a certain parallelism between the size of lethal dose and the amount of chemical material after removal of the glycerine and ammonium salts by dialysis. Besides lethal protein substances there were present carbohydrates. The protein substances were thermostable, acid-stable and in acid precipitation lost no activity. Diffused through animal membranes the lethal substances lost 25 to 50 per cent in strength during three days' dialysis. The specific substances were separated from the carbohydrates by adsorption into kaolin at an acid pH. In this way 80 to 90 per cent were adsorbed while the carbohydrates remained behind. The kaolin-adsorbed material was readily recovered by treatment with dilute ammonia. The concentrated purified preparation is 21 times stronger than the Sauton tuberculin. The biuret and ninhydrine reactions were always positive, while the Millon reaction was positive at times, and the tryptophan and Molisch reactions were absent. It is believed that the protein bodies are not essential to activity, nor is the carbohydrate. Whether the active substances are polypeptides or not is to be investigated.—*Über die Gewinnung und Reinigung von Tuberkulin, E. Maschmann and E. Küster, Zeitschr. f. Tuberk., 1931, lix, 225.*—(*H. J. C.*)

Preparation of the Spahlinger Antigen.—The object is to prepare *in vitro* antigens identical to those generated by tubercle in the living body. To prepare such antigens the tubercle bacilli are isolated directly without passage through another animal species, because this might alter their specificity by adaptation to a different zoölogical species. The bacilli are cultured on *specific* media which will supply *specific* biochemical material identical with that provided *in vivo*, thus enabling the microörganisms to retain and reproduce their biological and biochemical characters. No chemical or physical reaction or manipulation may be employed, either during or after the preparation of the antigens, which might alter or denature, even to a slight extent, the antigenic specificity. Methods for the preparation of antigens for the vaccination of cattle and human beings against tuberculosis are described. The vaccine for human beings comprises three different types of vaccine: *1:* A bovine vaccine made from bovine tubercle bacilli grown on specific bovine media. This media consists of tubes of a bovine body fluid (defibrinated blood, serum, tissue extract, etc.), slanted and coagulated at 65°C. After cooling, a small quantity of unheated bovine body fluid is spread on the surface of the coagulated (solid) medium. The tubes are left for forty-eight hours so that the normal bovine fluid can well impregnate the medium. As soon as a good growth of bovine tubercle bacilli is obtained on the medium, the culture is transferred to normal (unheated) specific bovine fluid. When the cultures have sufficiently developed, the bovine bacilli are emulsified in distilled water or physiological salt solution under aseptic conditions and in the absence of oxygen. The emulsion is stored in ampules in a cool, dark place until all the bacilli have died a *natural death.* It may be necessary to keep the vaccine a year or even longer before this results. It is then a harmless, though effective, material for preventive immunization. Each batch of vaccine must be tested before use so as to be quite certain that all the microörganisms are dead. Traces of antiseptics, formaldehyde for instance, may be added to the emulsion before sealing it in the ampules. The vaccines thus prepared retain for years their specific antigenic and vaccinating properties. *2:* A vaccine made from bovine tubercle bacilli grown on specific *human* media. *3:* A vaccine made from human tubercle bacilli grown on this media. Human tubercle bacilli are isolated directly from tuberculous lesions of human beings by culture on human medium made with defibrinated blood, serum, ascitic or pleural fluids prepared in the same way as the specific bovine medium. The human tubercle bacilli should be isolated without animal passage. When the culture has sufficiently developed the bacilli are reinoculated on normal (unheated) specific human medium, preferably liquid. When a good growth is obtained, the bacilli are collected and emulsified in a sterile manner as described above. This emulsion must contain several strains of tubercle bacilli (polyvalent). Distilled water, peptone, glucose, glycerin, etc., which do not affect the specific properties of the tuberculosis antigens, can be added in small quantities to the culture media. The human and bovine culture media employed must originate from tuberculosis-free bodies. Human body fluid should be filtered before being made up into the culture media and the bacilli grown on these media should be washed in salt, to remove traces of the culture medium, before being emulsified. Formaldehyde may also be added to the vaccine for human beings. The final human vaccine is a mixture of the three types of vaccine described above. The relative

proportion of these three varies according to the nature of the particular type of the tuberculous disease. No mention is made of the average proportion used or of the size of the dose, etc. *Potentialities of the method:* According to the type of immunization and the species of tubercle bacilli from which the antigens are derived, the materials used should be: (a) the bacterial bodies (whole endotoxins); (b) an extract of the bacterial bodies (partial endotoxins); (c) the specific liquid on or in which the microorganisms have grown; this liquid contains the soluble antigenic substances (exotoxins), —products of the bacterial metabolism and of the aggressive and defensive means elaborated by the pathogenic microörganisms; (d), a mixture of (a) and (c), or (b) and (c). There is experimental evidence indicating that this method can be successfully used against various diseases in human beings and animals, not only for preventive and therapeutic vaccination, but also for the preparation of antitoxic and antibacterial sera for test purposes, antigen-antibody reactions, etc.—*The Spahlinger Method for the Preparation of Specific Antigens. Statement Supplied by Mr. Henry Spahlinger, Lancet, February 6, 1932, ccxxii, 309.*—(*J. S. W.*)

Typhoid Agglutination in Tuberculosis.—In the course of a number of typhoid agglutination tests for diagnostic purposes it was observed that anomalous reactions might occur in cases of pulmonary tuberculosis. These reactions have been noted by other observers. In the present study 73 cases of pulmonary tuberculosis with a negative history of T.A.B. inoculation or of typhoid or paratyphoid infection were examined for agglutinins to the typhoid group of organisms, and these were found to be present in the blood of twenty-five. These 25 cases showed reactions of diagnostic significance which persisted for three months during the course of the investigation. Control investigations of 100 cases of nontuberculous mental hospital patients showed slightly positive reactions in only five. One of these was possibly the result of prophylactic inoculation against the typhoid group of fevers during army service. The results suggest that in a case showing persistent agglutination reactions of average low titre and not the rise of titre associated with the progress of true typhoid infection the possibility of tubercle should not be overlooked.—*Serum Agglutinations to the Typhoid Group in Cases of Pulmonary Tuberculosis, J. R. A. Madgwick, Lancet, May 21, 1932, ccxxii, 1091.*—(*F. G. P.*)

Haemoptysis.—Since severe haemoptyses are almost always bleedings from cavities, only mechanical measures are therapeutically successful. The method of choice is artificial pneumothorax, but phrenicectomy, intrapleural pneumolysis, extrapleural tamponing or thoracoplasty may be indicated. Pneumothorax should be done early, since severe haemoptyses have a tendency to recur and since they carry the danger of aspiration pneumonias and of asphyxiation. When a pneumonia has developed the peril of a consecutive pleuritis is imminent. It is, of course, necessary to determine the side of bleeding. This can be done without danger for the patient by careful physical examination.—*Zur Behandlung schwerer tuberkulöser Lungenblutungen, A. Sattler, Beitr. z. Klin. d. Tuberk., September, 1932, lxxx, 627.*—(*M. P.*)

Blood Properties in Haemoptysis.—In a number of patients with pulmonary tuberculosis and with haemoptyses, certain properties of the blood were determined during and after the haemorrhages, in order to establish whether the blood itself showed any changes which would explain the haemoptyses. The following factors were studied: bleeding time, coagulation time, thrombocytes, the Rumpel-Leede phenomenon, and the calcium content of the blood. Out of 20 patients examined, 15 were normal in all these regards. In 5 patients the bleeding-time was increased, the Rumpel-Leede phenomenon was positive during haemoptyses, while the other factors were normal. It must be concluded that in the majority of cases the haemoptysis is conditioned by the anatomical changes in the lung and not by haematological factors.—*Untersuchungen über Blutungsbereitschaft und Hämoptoe bei Lungentuberkulose, E. Essenfeld, Beitr. z. Klin. d. Tuberk., August, 1932, lxxx, 507.*—(*M. P.*)

Haematology of Pulmonary Tuberculosis.—The haematological alterations in pulmonary tuberculosis are so complex that a blood picture typical for the disease, or even for some of its phases, does not exist. Single haematological criteria are misleading, but careful observation of the totality of the blood pictures yields clinically significant information. In active tuberculosis, leucocytes and platelets are usually increased; a decrease is usually prognostically unfavorable, as are normal figures in the presence of severe clinical disease. Such cases usually show a toxic anaemia. These findings constitute a particularly unfavorable prognosis when they are combined with lymphopoenia

and with toxic alterations in leucocytes. Lymphocytosis is almost invariably favorable. The rare, prognostically unfavorable lymphocytoses are characterized by the frequency of pathological lymphocytes, such as plasma cells. Toxic changes in leucocytes indicate cavity-formation (mixed infection) or toxic damage to the bone-marrow. Eosinophilia is present in productive processes. With the exception of scarlet fever, Hodgkin's disease and leukaemias, tuberculosis is the only disease in which eosinophiles may persist in undiminished numbers in spite of a severe febrile course. The haematological criteria for a completely healed lesion are normal numbers of leucocytes and thrombocytes, normal nuclear distribution and absence of pathological lymphocytes, usually with some lymphocytosis.—*Das Blutbild der Lungentuberkulose, C. Oestreich, Beitr. z. Klin. d. Tuberk., June, 1932, lxxx, 187.*—(*M. P.*)

Contour of Tuberculous Female Chest.—In previous reports it was shown that the chest of the tuberculous male was more rounded, longer, and deeper than the normal chest, and that the vital capacity was about 40 per cent greater in the case of the healthy chest. In this report the normal chests of 300 university girls are compared with the chests of 133 tuberculous women. The ages of the normal girls ranged from 16 to 24 years and of the tuberculous group from 16 to 60 years. To make comparison closer the tuberculous cases were divided into 2 groups, 50 cases representing the ages 16 to 24 years and 83 cases representing ages 25 to 60. The average thoracic index, which is the ratio of the depth of the chest to the width, was 70.2 for the 300 university girls. The average thoracic index for the tuberculosis cases of ages 16 to 25 was 73.3, and for those of ages 25 to 60, 72.1. These figures show that the tuberculous chest was more rounded than the normal and that the older tuberculous group had flatter and better developed chests than the younger group. The chest of the normal female was more rounded than that of the normal male. The deeper, more rounded chest is an undeveloped one, has a lower vital capacity, and is probably more susceptible to tuberculosis. Measurements of the subcostal angle in the cases studied are in accord with the thoracic indices. There is evidence that proper exercises in early life can stimulate chest development.—*Observations on the Contour of Normal and Tuberculous Female Chests, S. A. Weisman, Ann. Int. Med., January, 1932, v, 907.*—(*R. M. F.*)

Asymmetry of Female Breasts in Tuberculosis.—Differences in the size, configuration, position or consistency of the two breasts in female tuberculous patients are quite common, and are ascertained by inspection, palpation, measurement, or by the weight of the dissected organs in cases which come to autopsy. The latter method has been used by Hennig, who reports that in 300 cases the bigger breast was found on the right side, while, according to Glaesmer-Amersbach, the right breast is, as a rule, slightly smaller than the left. With such conflicting observations, the interpretation of differences in the size of the breasts under pathological conditions is extremely difficult, because the smaller breast is sometimes found on the involved side and in other cases on the contralateral side. The explanation advanced by Kokalj-Kowalewska that the smaller breast is always the result of an atrophy which is caused by trophic lung reflexes is, therefore, not satisfactory, and we must assume that morbid changes in the lung can cause in the mammae both atrophic and hypertrophic changes which are accompanied by varying degrees of ptosis. The latter, as a rule, is more noticeable in the hypertrophic breast even though at a later stage the more descending breast can be found smaller and atrophic. Differences in the size and in the degree of ptosis can be determined objectively by the measurement of the lower arch (distance from the centre of the mammilla to the lower border of the breast in the mammillary line). In order to reach the lower borders on the anterior surface of the chest, pendulous breasts have to be lifted. By carefully questioning the patients, the onset of the changes was investigated and it was found that very often the difference in the two breasts was first noted at the time when the pulmonary disease became manifest and particularly at the time when artificial pneumothorax was instituted. The theory that disease in the lungs or pleura is followed by atrophic changes in the breast fails to explain the presence of the more voluminous mamma on the involved side. Differences in size, consistency or position of the breasts are obviously the result of many factors, the most important of which is the tissue which is affected by atrophy or hypertrophy. While the glandular portion in the nulliparous or nonpregnant woman plays a negligible part, a good amount of fibrosis will make the breast firm. The pendulous breast, on the other hand, will develop if the interstitial tissue atrophies and if the amount of the fatty portion of the breast is increased or if the turgor

of the skin is diminished. An adequate explanation of all of these confusing phenomena is presented on the basis of Sorgo's theory on skin manifestations following changes in the parietal pleura. Sorgo has demonstrated that pathological changes in the parietal pleura interfere with the proper lymph-circulation of the wall of the chest. The skin of the chest, the *subcutis*, the intercostal muscles and the mammae, are drained through the small lymph-vessels which are closely adjacent to the parietal leaf of the pleura, and any pathological condition of the latter will cause a passive lymph congestion and even a retrograde flow of the lymph-stream. According to Sorgo, marked changes in the skin and subcutaneous tissue soon develop. The skin becomes thicker and succulent and feels doughy on palpation of a raised skin fold. The mammae having partly the same draining channels increase in size and weight on the side where the diseased parietal pleura interferes with normal lymph-circulation, and the author points out, in support of Sorgo's views, that both the more voluminous breast and the increased thickness of the skin were always found on the involved side, unless the breast was hypoplastic and smaller before the onset of the pleural disease. At a much later stage, the breast may become smaller, due to an increase in the formation of interstitial tissue in the mammae and of adhesions in the subcutis. The author concludes that differences in the female breasts can be explained by the chronic lymph-stasis which develops whenever the draining lymph-channels are obstructed by a pathological process in the parietal pleura. Neither the changes in the mammae, nor the skin manifestations which are found on the same side, are characteristic for pulmonary tuberculosis, and an inflammatory process in the parietal pleura may be the aetiological factor. Since in chronic, fibrous tuberculosis the pleura is nearly always involved, the described changes are so frequently seen in women suffering from chronic phthisis.—*Asymmetrien der weiblichen Brust bei Erkrankungen der parietalen Pleura, A. Sattler, Wien. klin. Wchnschr., July 22, 1932, xlv, 942.*—(*K. F.*)

Diagnosis of Tuberculosis.—Before 1924 the criteria of the early diagnosis of pulmonary tuberculosis depended upon the idea of an insiduous onset of the disease, with gradual increase in constitutional symptoms. The lesion was considered to be small, discrete, situated just below the apex, and spreading caudally. Since 1924 Assmann and Redeker have taught that pulmonary tuberculosis starts as an acute infiltration, the primary focus being situated anywhere in the lung field, but usually in the infraclavicular region. A survey of the literature of Germany, Austria, America and Italy indicates that the new teaching is gaining adherents among clinicians, while pathologists hold the older view. It is pointed out that pathologists see only advanced phthisis at necropsy. The new teaching has had a useful effect in emphasizing the fact that pulmonary tuberculosis is almost always recognizable clinically and roentgenographically before the usually accepted constitutional symptoms have appeared.—*The Diagnosis of Early Pulmonary Tuberculosis, H. V. Morlock, Brit. J. Tuberc., October, 1931, xxv, 170.*—(*R. M. F.*)

Incipient Pulmonary Tuberculosis.—Since the final prognosis of closed cases is infinitely better than those of open cases, all efforts must be directed toward recognizing pulmonary tuberculosis before the sputum becomes positive. It was found necessary in this connection to study the mechanism by which closed cases become open. For this purpose 125 cases who became open during observation were studied. In 63 per cent of these cases the initial prognosis seemed good, in 34 per cent doubtful, and only in 2 per cent bad. Forty-nine per cent of the cases started with exudative foci, 28 per cent showed productive lesions, and 8 per cent had calcified or scarred lesions. The interval between first focalization, leading to calcification or scarring and exacerbation, is long and is estimated to be ten to twenty-five years. The exacerbation may start as an infiltrative lesion or it may manifest itself in a slow apicocaudal progression. Activations which develop from exudative lesions usually progress as clinical exacerbations with normal intervals, but these exacerbations need not be acute, and the intervals may be of considerable length. During the active phases symptoms may be absent, and the sedimentation, blood picture and temperature may be normal. The interval between the first diagnosis of a closed lesion and the diagnosis of an open lesion varied between four months and twelve years. In initially productive lesions, the development is slower on the average; otherwise the observable processes are the same. Proper diagnosis is impossible without the use of roentgenological examinations. The sedimentation tests were 10 mm. or less in 41 per cent of the patients at the time of the first diagnosis, and in 10 per cent at the time of the first demonstration of bacilli in the sputum. Since about 75 per cent of all patients with open pulmo-

nary tuberculosis are open at the time of the first examination, the question arises whether certain forms of pulmonary tuberculosis are open at the very onset. Completely convincing studies are not available to decide this question, but the available evidence would indicate that most cases are closed for some time before they shed bacilli. A large percentage of those cases with positive sputum on first examination give a history of acute onset. In 12 per cent of them bacilli are found at the onset of symptoms, and in 65 per cent within three months after onset. The frequency of early open pulmonary tuberculosis in diabetics is stressed, especially in those more than 40 years old. It is calculated that the frequency of this occurrence is 28 times greater than in the nondiabetic population above 40 years. Measures for epidemiological control are discussed essentially in the light of local German conditions.—*Beginn und Verhütung der offenen Lungentuberkulose des Erwachsenen, H. Braeuning, Beitr. z. Klin. d. Tuberk., October, 1932, lxxxi, 12.—(M. P.)*

Diagnostic Artificial Pneumothorax.—Artificial pneumothorax frequently differentiates pleural, pulmonary and mediastinal tumors when other diagnostic methods fail. In the absence of a pleural effusion, the technique is similar to that used in the treatment of pulmonary tuberculosis. The amount of air introduced is determined by the intrapleural pressures, the vital capacity, and the subjective reaction of the patient. In the presence of pleurisy with effusion, thoracocentesis should be performed and, in order to avoid severe respiratory or circulatory disturbances, each syringeful of fluid should be replaced at once by an equal amount of air. Following the introduction of air, the patients are examined fluoroscopically and roentgenologically. The position of tumors of the parietal pleura is unchanged following pneumothorax, postural changes of the patient, inspiration or expiration. Pulmonary tumors are displaced by air, change their position with postural changes of the patient, move toward the pneumothorax side on inspiration and return toward the opposite lung on expiration. Mediastinal tumors are seldom displaced by air, their only appreciable movement being the swing toward the pneumothorax side on inspiration and the return on expiration. The diagnostic value of pneumothorax may be limited by pleural adhesions. In many cases, however, the procedure will be of great aid and will also serve as a guide in (1) the selection of operable cases, (2) the type of anaesthesia, and (3) proper surgical approach, as the two reported cases indicate.—*Diagnostic Pneumothorax: an Aid in the Diagnosis of Pleural Tumors, W. B. Faulkner, Jr., and E. C. Faulkner, Radiology, May, 1932, xviii, 1023.—(T.O. R.)*

Tubercle Bacilli in Blood.—In view of the conflicting evidence as to the presence of the tubercle bacillus in the blood stream during the progress of tuberculosis, attempts at demonstration and cultivation of the bacillus from human and animal material are here recorded. Cultures were made, using the heart's blood from 14 guinea pigs (infected from 51 to 101 days previously). About 15 cc. of blood was pipetted into a centrifuge-tube containing 15 cc. of 1.5 per cent sodium citrate in physiological saline solution; centrifugated for five minutes, the supernatant fluid pipetted off, the red cells haemolyzed by 15 cc. of sterile distilled water; shaken, centrifugated for ten minutes, the supernatant fluid pipetted off, and freshly distilled water added. By this means a very small deposit of faintly stained, shreddy debris was obtained; this was transferred by pipette to a tube of a synthetic fluid medium to which 10 per cent of ox-serum had been added. After three weeks' incubation, and again after a further period of three to four weeks, the deposit in the broth was filmed and stained Ziehl-Neelsen. In one case 2 typical acid-fast bacilli were found in the film; subculture of this tube on Dorset's egg medium failed to grow. No acid-fast bacilli were demonstrated in the other 12 cultures. In the next series of 6 guinea pigs the deposit obtained in the same way was cultured directly on Dorset's egg medium, two slopes being used for each deposit. In no case were acid-fast bacilli found. For the final series, a modified Loewenstein's technique was used. By this method blood from 21 guinea pigs was cultured. In no case were acid-fast bacilli found. It was thought possible that culture of the clots of blood taken from cases of pulmonary tuberculosis for serological tests might yield some positive results. The clot from 10 cc. of blood, from which the serum had been pipetted, was cut up with sterile scissors and placed in a flask; 25 cc. of a freshly prepared solution of 1 per cent pepsin dissolved in 0.5 per cent hydrochloric acid was added and the mixture incubated at 37°C. for four hours, being shaken at intervals. The fluid was then centrifugated and the deposit treated with an equal volume of 10 per cent sulphuric acid for 10 minutes. The deposit was spread directly on the surface of Dorset's or Petroff's egg medium. In none of these were acid-fast bacilli found. The heart's blood of 63 tuberculous

guinea pigs was cultured (in 0.5-cc. amounts) in veal broth by the method of Dreyer and Vollum. By this method one primary culture was obtained, and in two cases subcultures on egg medium were successful. In another series the blood from 16 tuberculosis patients was injected into guinea pigs. From 4 to 10 cc. of blood from an arm-vein was added to an oxalate tube, and injected intraperitoneally into guinea pigs as soon as practicable. In some cases this was followed by the formation of a slough at the site of inoculation, which healed in due time. One animal died ten days after inoculation. One animal, inoculated from a case of advanced pulmonary tuberculosis, developed glandular and generalized tuberculosis. The other fourteen proved negative.—*Tubercle Bacilli in the Blood Stream in Human and Animal Tuberculosis, C. Weatherall, Lancet, May 7, 1932, ccxxii, 980.*—(*F. G. P.*)

Cultivation of Tubercle Bacilli from Blood.—The efficiency of Corper's potato medium was tested on 66 specimens, four tubes being inoculated from each specimen. From a total of 46 specimens proved by other methods to contain tubercle bacilli, successful cultures were obtained with eight. The efficiency of the Huth and Lieberthal modification of the Hohn egg medium was tested on 34 specimens. From a total of 24 specimens proved to be tuberculous, successful cultures were obtained in 12. Tubercle bacilli were never isolated in culture when other methods failed. Blood culture was performed in cases of tuberculosis, disseminated sclerosis, and lymphadenoma, using a slightly modified Loewenstein's technique, and in no case was a positive result obtained.—*The Cultivation of the Tubercle Bacillus and the Occurrence of Tuberculous Bacillaemia, J. N. Cumings, Lancet, May 7, 1932, ccxxii, 983.*—(*F. G. P.*)

Cultivation of Tubercle Bacilli from Blood.—The author describes the preparation of his culture medium which contains asparagin in place of peptone (considered detrimental), potato-flour, and congo-red as dye, with eggs as the basic nutrient. He also describes the method of preparing the blood with acetic acid and sulphuric acid, if necessary. Haemoglobin is detrimental to the growth of the tubercle bacilli and must therefore be removed. The resulting colonies obtained by his method differ from those regularly seen in some cases, and resemble the avian strain. The author maintains that guinea-pig inoculation cannot compare with his culture procedure. The method used has been given in detail previously by the author, but is described again in this article.—*Die Züchtung der Tuberkelbacillen aus dem strömenden Blute, E. Loewenstein, Centralbl. f. Bakt., I, Orig., 1931, cxx, 127.*—(*H. J. C.*)

Cultivation of Tubercle Bacilli from Blood.—It was shown in previous experiments that neither serum nor plasma has any bactericidal action on tubercle bacilli and the present study proved that this holds true for whole blood. Since, in the usual culture methods, only a very limited amount of blood can be seeded, a minimum of one hundred bacilli per cc. must be present in order to yield cultures. By seeding the blood in the depths of serum media, a larger amount of blood can be used, and, since bacilli grow well in such cultures, this method is highly recommended for the isolation of tubercle bacilli from the blood. It was found that tubercle bacilli accumulate in the leucocytic layer of centrifugated blood; it is therefore this portion that should be used for cultures.—*Untersuchungen über die Bedingungen der Züchtung von Tuberkelbacillen aus Blut, O. Kirchner und B. D. Li, Beitr. z. Klin. d. Tuberk., August, 1932, lxxx, 460.*—(*M. P.*)

Cultivation of Tubercle Bacilli from Blood.—Since 1930 attempts to culture tubercle bacilli from the blood of tuberculous children have been made by use of the culture medium recommended (and apparently successfully used) by Loewenstein. Negative cultures resulted in all cases. These comprised 3 cases of cavernous pulmonary tuberculosis, 2 of disseminated pulmonary tuberculosis, 3 cases of epituberculosis, one of erythema nodosum, 4 cases of tuberculous meningitis, 2 of healed bone-and-joint tuberculosis and 7 nontuberculous cases (nephrosis, bronchiectasis, arthritis deformans, polyarthritic rheumatism). These findings are in marked contrast to the results reported by Loewenstein.—*Zum kulturellen Nachweis der Tuberkelbazillen im strömenden Blut, H. Opitz, Deutsche med. Wchnschr., March 11, 1932, lviii, 404.*—(*H. S. W.*)

Cultivation of Tubercle Bacilli from Blood.—Search for tubercle bacilli through culture, à la Loewenstein, by means of acetic-acid precipitation is inadequate, as the procedure in itself and the media used lead to numerous errors. More than 25 per cent of egg media are contaminated by various acid-fast microörganisms. Haemolyzation of the blood with 0.5 per cent saponin solution is preferable to precipitation by acetic acid. If these media are inoculated with haemolyzed sediment, they allow much

easier recognition of eventual contaminations.—*Die Fehlerquellen bei der Untersuchung des Blutes auf Tuberkelbazillen und ihre Vermeidung, B. Busson, Deutsche med. Wchnschr., June 3, 1932, lviii, 888.*—(*H. S. W.*)

X-Ray Diagnosis of Early Tuberculosis.—Two types of early tuberculosis in adults are seen. The larger number show a conical zone lying below the clavicle with its base toward the axilla. On close examination the shadow shows a network of delicate lines enveloped in a filmy veil. The second group shows single or multiple spherical shadows, also in the infraclavicular region. Common to both groups is an accentuation of the bronchovascular trunks leading to the hilum. In differential diagnosis, bronchiectasis, malignant metastases, an azygos lobe, shadows from extraneous causes, accentuation of bronchovascular markings without corresponding parenchymal shadows, localized simple pneumonitis, and small healed tuberculous lesions are to be considered. It is at times difficult to give an opinion as to the activity or inactivity of a tuberculous lesion on the basis of a single roentgen examination. Early tuberculosis in children may show as a Ghon focus, or as a mediastinal lymphadenopathy. If parenchymal disease is present it is often near the hilum or in the lower portion of the lobe invaded. The diagnosis must be made with caution and may require extended observation. Miliary tuberculosis may arise from a small hidden focus and may under certain circumstances be entitled to mention as an early form of the disease. In its early phases roentgenological evidence may be lacking; later the typical granular, mottled marble appearance is seen.—*Roentgenologic Diagnosis of Early Pulmonary Tuberculosis, B. R. Kirklin, Ann. Int. Med., September, 1932, vi, 435.*—(*R. D.*)

Roentgenograms in Incipient Pulmonary Tuberculosis.—Many authors have stressed the relationship between the topography of the lesion in the early phases of clinical pulmonary tuberculosis and the subsequent evolution of the disease. The conviction is expressed that the anatomical configuration is a determining factor of more fundamental importance. Lesions, initial in the sense of association with the first clinical manifestations of disease, are grouped as primary or secondary, a concept of clinical order which differentiates between those situated in an area previously undiseased or otherwise. Only the former are considered in this preliminary report. Two hundred and thirty-two cases were studied within a few days or weeks of their primary clinical manifestations, in an attempt to characterize anatomically the roentgenological findings. The roentgenograms were taken at 1.5 m., 60–70 milliamperes, in one-tenth second. In 44 per cent of the cases foci were revealed, characterized by some or all of the following: *1:* Conservation of the bronchovascular markings, with diffuse or localized, oval or circular thickenings (peribronchitis). *2:* Round, small, sharply delimited, homogeneous shadows. *3:* Cavities of regular, precisely demarcated outlines, and without fluid-levels. *4:* An uninvolved surrounding parenchyma. Such foci were termed nodular. In 49 per cent the foci exhibited: *1:* Veiling or total obliteration of the bronchovascular markings. *2:* Irregular shadows of variable size indefinitely outlined. *3:* Cavities with fluid-levels. *4:* Involvement of the surrounding parenchyma. These were termed pneumonic. The qualifying term *ulcerous* was applied to each of these major groups if small areas of clearing, indicative of destructive processes, as well as frank cavities were seen. This was true in 68.5 per cent of the cases. Occasionally two foci of disease were present, but the primary one could be usually determined by its greater area and diversity of elements. In the pneumonic group these secondary foci appeared earlier and were more rapidly destructive. Seven per cent of the cases were mixed in type. Of the whole series, 20.3 per cent were apical lesions in part, but only 2.3 per cent were entirely so; 11.2 per cent were insidious in clinical onset; 71.2 per cent had not been exposed to contagion, and 18.5 per cent presented no stethoscopic signs. The nodular types were proportionately higher than the pneumonic in apical localization, insidiousness of clinical onset, exposure to known contagion, and in stethoscopic findings. Haemoptysis, which occurred as the initial symptom in 65 per cent, modified the roentgenogram. In contrast to other forms of intrapulmonary haemorrhage (rupture of aneurysmal sacs, hydatid cysts, etc.) multiple infarcts were often striking. The determining factor was the reaction evoked by the bacillary emboli. Partial atelectasis or massive collapse has also been observed as a sequel. The bleeding focus may be differentiated by the density and greater size of its shadow. Seventy-nine per cent of the cases with haemoptysis presented roentgenological evidence of ulceration. The results of this preliminary study indicate that these distinctive anatomicoroentgenological types occurring in the initial phases of the clinical manifestations of pulmonary tuberculosis have well-defined characteristics of order,

form of onset, localization, etc. Such strictly anatomical study, aside from questions of conditions of infection and constitution, may have practical consequences in prognosis and the early selection of the most efficacious therapeutic agent.—*Les types anatomo-radiographiques de la lésion tuberculeuse pulmonaire initiale de l'adolescent et de l'adulte, L. Saÿe, Rev. d. l. Tuberc., May, 1932, xiii, 457.*—(*A. E. M.*)

Stereoscopic Chest Films.—A simple and inexpensive technique for the production of stereoscopic chest films with ordinary X-ray apparatus is described. Immobilization of the chest is effected by tying the sitting patient to a piece of ply-wood attached behind the cassette, a surgical bandage being used. It is not necessary that the two exposures of film be made during the same "holding" of breath, but an interval of one or more minutes may be allowed for the shifting of the tube.—*A Simple Way of Making Stereoscopic Chest Films, E. Zimmerli, Tubercle, July, 1932, xiii, 440.*—(*M. E. P.*)

Roentgenology of Diseases of Lungs.—The correlation of clinical findings with radiological studies in pulmonary diseases is emphasized. Definite infiltrations can be demonstrated by X-ray frequently before definite physical signs are present. Consistently negative X-ray evidence, extending over a period of several months, may be taken as conclusive proof of the nonexistence of pulmonary tuberculosis. When physical signs are present, it may be assumed that the initial stage has passed and much more extensive disease exists than can be demonstrated by physical examination.—*Radiology in Diseases of the Lungs, S. Melville, Brit. M. J., August 13, 1932, no. 3736, 283.*—(*M. E. P.*)

Unilateral Opacities in Chest Films.—The correct diagnosis of those conditions of the chest which produce unilateral opacities in the roentgen-ray films cannot be made from the films alone. Six different cases have been presented in support of this view. The physical conditions of the chest which may produce opacities in the X-ray film are as follows: Tumors of the chest-wall, fluid in the pleural cavity, tumors of the pleura, atelectasis of the entire lung, pneumonia, tuberculosis, massive infections of the lung, and marked pleural thickening or fibrosis. The correlation of history and physical signs with the diagnostic procedures of bronchography and diagnostic pneumothorax are necessary in order to arrive at a correct diagnosis.—*Unilateral Opacities in Chest Films, J. J. Singer, Am. J. Med. Sc., March, 1932, clxxxiii, 392.*—(*W. I. W.*)

Significance of Annular Shadows.—A case is reported in which an annular shadow was seen to develop in a lung partially collapsed by pneumothorax. The patient was a girl, aged 18. Constitutional and local symptoms were absent, the sedimentation rate remained normal, and there was gain in weight, but it is not stated whether the sputum was negative for tubercle bacilli. Annular shadows are not accounted for by pleural rings, localized pneumothoraces, or air-pockets in the region of the interlobar fissures. The remaining hypotheses are the "true cavity" theory and Mitchell's air-cyst theory. It is felt that clinical and roentgenological evidence in this case supports the latter view, though as yet the existence of these cysts is not recognized by pathologists.—*Significance of "Annular Shadows" in Radiograms of the Chest, J. Sowerbutts, Lancet, September 17, 1932, ccxxiii, 623.*—(*E. H. K.*)

Bronchoscopic Diagnosis of Pulmonary Disease.—The use of the bronchoscope makes diagnosis of diseases of the lungs more accurate. Proof of the presence of bronchial carcinoma, which is apparently the most common form of pulmonary neoplasm, can be had at an early stage of the disease only by bronchoscopy. Blocking of a bronchus by a neoplasm may give rise to clinical syndromes, such as lung abscess, bronchiectasis and atelectasis, which do not indicate their cause. Bronchoscopy affords accurate diagnosis and treatment when other methods may fail. The constant localization of a rhonchus or any sensation of sticky mucus by a middle-aged person with a cough which has appeared only recently should suggest the presence of an early bronchial neoplasm and bronchoscopy should be done. For treatment of the various types of pulmonary suppuration determination of cause and exact location is important. This can be done best by bronchoscopy, especially if the bronchus is occluded so that lipiodol can be instilled only after removal of the obstruction. Bronchoscopy enables one to obtain material for laboratory examination directly from the diseased site. Cases of haemoptysis with no disease demonstrable by other methods may originate in a bronchus and be accessible by bronchoscopy. No ill effects due to bronchoscopy have been seen in 450 patients bronchoscoped under local anaesthesia. One-third of these patients were treated as out-patients.—*The Bronchoscope in the Diagnosis of Pulmonary Disease,*

A. J. S. Pinchin and H. V. Morlock, Lancet, January 30, 1932, ccxxii, 224.—(R. M. F.)

Bronchoscopy.—The value of this procedure is discussed, with reference especially to the diagnosis and treatment of conditions in the tracheobronchial system, such as foreign bodies, lung abscess, bronchiectasis, bronchitis, asthma and neoplasms. In cases of diphtheria the air-passages may be kept clear of sloughs and secretions by endoscopy, thus avoiding tracheotomy and intubation. Of 72 patients for whom bronchoscopy was used as a means of treatment a total of 28 were cured and 26 were improved.—*The Value of Endoscopic Methods in the Upper Air Passages, V. E. Negus, Lancet, July 23, 1932, ccxxiii, 169.—(R. M. F.)*

Angiopneumography.—A method was developed for the roentgenological visualization of the pulmonary vessels. A fine and long catheter is introduced into the cubital vein and, by careful manoeuvering pushed into the right auricle. Then the contrast substance, a 120 per cent (*sic*) sodium-iodide solution is injected. As soon as 6 to 8 cc. of this solution are injected a roentgenogram is taken. The exposure must be very brief in order to produce well-defined photographs. Such pictures show convincingly that the normal lung markings are chiefly produced by blood-vessels, and not by the bronchi.—*Die Angiopneumographie, L. de Carvalho, Beitr. z. Klin. d. Tuberk., September, 1932, lxxx, 681.—(M. P.)*

Incidental Pulmonary Findings.—In 2,000 patients with abdominal complaints, roentgenological studies of the chest were made. In 7 per cent noncalcified parenchymatous foci, and in 0.45 per cent cavities were demonstrated. Such findings emphasize the necessity of careful roentgenological studies of the chest in patients who seek medical advise primarily for abdominal disturbances.—*Zufällige Lungenbefunde bei der Röntgenuntersuchung des Verdauungstrakes, E. Koppenstein, Beitr. z. Klin. d. Tuberk., August, 1932, lxxx, 532.—(M. P.)*

Tuberculin Tests.—Because of the high incidence of tuberculosis in the colored race and the frequency of reinfection, the degree of skin sensitivity in negro children with tuberculous infection is high. Among such children the Pirquet test is as frequently positive as the Mantoux, and at the same time much less often accompanied by severe local or general reactions. Where the incidence of tuberculosis is high (Negro, French, Viennese, Porto Ricans) the Pirquet test should be used as routine, the Mantoux being performed later if the dermal test is negative.—*Comparative Value of Von Pirquet and Mantoux Tests in Colored Infants and Children, M. Gleich, Arch. of Ped., June, 1932, xlix, 399.—(M. D.)*

Epidermal Tuberculin Tests and Thyroxin.—In recent studies Nathan and Kallos found that patients with tuberculosis of the skin reacted to an epidermal tuberculin application, to which patients with visceral tuberculosis did not react. They conclude that the epidermal tuberculin reaction is strictly specific for cutaneous tuberculosis. By using epidermal and endodermal tests in strictly quantitative arrangements, the authors could show that the epidermal tuberculin reaction is only quantitatively different from the endodermal test and that it is in no way specific for cutaneous tuberculosis. The addition of thyroxin to tuberculin does not increase the reaction, contrary to other reports. Although it can be definitely shown that thyroxin has no influence on the tuberculin test on local application, it is still likely that it may increase the tuberculin allergy on subcutaneous or intravenous administration.—*Über die Tuberkulinläppchenprobe und den Einfluss des Thyroxins auf die Tuberkulinhautreaktion, A. V. v. Frisch and F. Nagel, Beitr. z. Klin. d. Tuberk., August, 1932, lxxx, 491.—(M. P.)*

Tuberculin Diagnosis in Monkeys.—The usual tuberculin tests in monkeys, either in their local or their general manifestations, are worthless, whether these are the ophthalmo, the Mantoux or the intracutaneous test, with concentrated on diluted tuberculin. Intramuscular injections of large doses of from 3 to 5 cc. of a mixture of undiluted ophthalmo tuberculin and Old Tuberculin result in the death of tuberculous monkeys, with the symptoms of a general severe intoxication, within 1 to 3 days. In healthy monkeys the intramuscular injection of the same dose of tuberculin calls forth no pathological reaction.—*Über ein Verfahren zur Diagnostik der Tuberkulose beim Affen, A. Nohlen and M. Sarvan, Beitr. z. Klin. d. Tuberk., 1931, lxxvii, 186.—(H. J. C.)*

Functional Testing of Circulation in Tuberculosis.—The changes in the vegetative nervous system had previously been studied by pharmacological methods of examination, especially with adrenalin, and the majority of authors have taken the view that in favorable forms of tuberculosis sympatheticotonic symptoms predominate, while in severe unfavorable forms vagotonic symptoms predominate. The author's investigations were on 750 cases of pulmonary

tuberculosis of the third stage and they were classified according to the severity of the toxic manifestations. Observations on the blood-pressure and the pulse showed that with an accommodation to toxaemia the reserve of the heart diminished. Other cardiac indices possess only relative value and were only crudely of orienting significance. In the more severe group there were usually found functional murmurs, and especially accentuation of the second pulmonic sound, while in the compensated cases the heart tones were pure and the second pulmonic sound was more distinct. In the more severe processes the smaller heart was found. The theory of an inequality in the tone of the different parts of the sympathetic and parasympathetic nervous systems cannot be considered proved. The physical tests for the determination of the functional condition of the circulation are the most reliable. The examinations with adrenalin can only be evaluated with a satisfactory knowledge of the circulation. The action of adrenalin can be injurious. The spastic contraction of the peripheral vessels places on the heart of the tuberculous patient too great a strain.—*Über die funktionelle Prüfung des Zirkulationsapparates und des vegetativen Nervensystems bei Lungentuberkulose, F. A. Michailow, Zeitschr. f. Tuberk., 1931, lx, 40.*—(*H. J. C.*)

Choroidal Tubercles.—The clinical significance of the two types of choroidal tubercles, commonly known as the *choroidal miliary tubercle* and the *granuloma* or *solitary tubercle*, is discussed. *Choroidal miliary tubercles:* These are usually associated with acute miliary tuberculosis. The incidence given in the literature reviewed is from 14.6 to 44 per cent for tuberculous meningitis and from 21.7 to 100 per cent for acute miliary tuberculosis. The usual number of tubercles in the eye is three or four, and their size varies from 0.4 to 5.0 mm. Groenouw stated that tubercles smaller than 0.6 mm. cannot be seen with the ophthalmoscope. The diagnosis depends chiefly upon a rapid appearance of the tubercles, which has been reported to have occurred within four hours. They have been seen as early as the sixteenth day of illness, (in the case herein reported), but usually do not appear until three days before death. Both eyes should be examined. The presence of miliary tubercles may aid in the differentiation of typhoid fever. *Solitary or conglomerate tubercle of the choroid* is a rare and destructive disease and is usually associated with chronic tuberculosis elsewhere in the body. Usually it involves both eyes and occurs early in life. Differentiation from malignant growth and detachment with massive exudate may be difficult. Enucleation is not indicated unless all other therapy, especially tuberculin, has failed. The case reported may be summarized as follows: A boy, aged ten years, acutely ill, was hospitalized twelve days after illness began, and was treated for typhoid fever. There was no history of contact with tuberculosis. Ophthalmoscopic examinations made three or four times daily revealed retinal oedema, subretinal exudate, and slight bilateral optic neuritis on the fourteenth day, but tubercles were seen first on the sixteenth day. The pathological diagnosis was miliary tuberculosis with meningitis.—*The Clinical Significance of Choroidal Tubercles, R. T. Paton, Ann. Int. Med., February, 1932, v, 997.*—(*R. M. F.*)

Tonsils and Adenoids in Tuberculosis.—Secondary infection of the tonsils in pulmonary tuberculosis is relatively common and occurs through contact with sputum. It is rarely found in advanced pulmonary tuberculosis in children because they swallow their sputum. Primary tuberculous infection of the tonsil is infrequent. Statistics indicate that in patients without clinical evidence of tuberculosis, tuberculous lesions can be demonstrated in the lymphatic tissue of the upper respiratory tract in less than 5 per cent of cases. Tonsils enucleated in cases of tuberculosis of the upper cervical nodes contain tuberculous lesions in 50 per cent of all cases, and are thought by Mitchell to be the primary focus of infection. The causative agent is the bovine tubercle bacillus and infection occurs through contact with infected milk. Laryngologists agree that the clinical diagnosis of tuberculosis of the tonsil is impossible. The most significant finding is the enlargement of a lymph node in the area between the upper part of the sternomastoid and the lower jaw immediately over the posterior belly of the digastric muscle. This is perhaps the most urgent indication for tonsillectomy. The majority of patients whose excised tonsils or adenoids are tuberculous will never have clinical tuberculosis.—*Tonsils and Adenoids in Relation to Tuberculous Infection, M. Vlasto, Brit. J. Tuberc., July, 1931, xxv, 129.*—(*R. M. F.*)

Treatment of Tuberculous Laryngitis.—Two practical points in the treatment of pain associated with tuberculosis of the larynx are discussed. When the pain is due to a "burning" stiffness of the pharynx, resulting from the drying and inspissation of mucus on the back wall, relief may be obtained by gargling with a solution of

sodium bicarbonate. When the pain is due to ulceration, the application of a fine galvanocautery point destroys the exposed nerve-endings and removes the pain. When there is doubt as to the exact location of the painful area a laryngeal probe coated with cotton-wool should be applied to various parts of the larynx until the patient makes it known that the pain-producing part has been touched. Two cases are cited in which there was disappearance of painful swallowing and marked improvement in the general condition following the application of the galvanocautery to painful laryngeal ulcers.—*The Treatment of Laryngeal Tuberculosis, J. Dundas-Grant, Lancet, November 5, 1932, ccxxiii, 999.*—(*E. H. K.*)

Fenestrated Ribs.—A report is made of observations on fenestrated and forked ribs in tuberculous patients with emphasis on the interpretation of such shadows in roentgenograms. Nine such anomalous ribs were found in nearly 2,500 patients; 6 were on the third and fourth ribs where they interfere greatly with tuberculous lung shadows. There were 2 in females and 7 in males. Three were on the third right, 3 on the fourth left, 2 on the fifth left and 1 on the seventh left.—*A Note on Shadows of Fenestrated Ribs in Roentgenograms, H. C. Sweaney, Am. J. Roentgenol. & Rad. Ther., October, 1932, 541.*—(*W. I. W.*)

Bronchial Lymph-Node Tuberculosis in Adults.—The bronchial lymph nodes are the place for the accumulation of tuberculosis, and they are viewed as a "lymphatic heart." Regardless of the portals of entry, tuberculosis of the bronchial lymph nodes is found. Bronchial-gland tuberculosis is not limited to children, but is also found in adults. Besides the tumor-like form which is seen especially in children, there are found cases with slight or no thickening of the lymph nodes, but which are associated with tuberculo-toxic symptoms and lymphocytosis. Bronchial asthma is frequently found in the presence of involved nodes at the bifurcation, and such cases are considered to be tuberculous.—*Die Bronchialdrüsentuberkulose des Erwachsenen, E. Schulz, Zeitschr. f. Tuberk., 1931, lx, 24.*—(*H. J. C.*)

Pleural Adhesions in Pulmonary Tuberculosis.—Two hundred and fifty-three patients with artificial pneumothorax were studied with regard to the frequency and localization of pleural adhesions. Adhesions were present in 240 cases between lung and thoracic wall, and in 243 cases between lung and diaphragm. Most frequently, the adhesions are attached to the upper lobe; they are, however, more frequent at the level of the first rib than at the extreme apex. Even in isolated upper-lobe lesions, diaphragmatic adhesions are very frequent.—*Über Pleuraadhäsionen bei Lungentuberkulose, J. Fuld, Beitr. z. Klin. d. Tuberk., September, 1932, lxxx, 612.*—(*M. P.*)

Primary Tuberculosis of Breast.—The typical history of primary tuberculosis of the breast is about as follows: A woman, otherwise healthy, between the ages of twenty and thirty discovers a small slightly painful lump in her breast. Pain and tumor are present several months before suppuration appears. The discharge from the sinus, which forms later, contains caseous material. If the diseased area is completely excised at this stage, cure is certain. The average duration of the disease is ten months. The treatment consists of surgical removal of the infected mass *in toto*. One case illustrating these typical points is reported.—*Primary Tuberculosis of the Breast, L. E. Mahoney, Am. J. Surg., October, 1932, xviii, 97.*—(*J. F. B.*)

Intestinal Primary Complex.—This study aimed at answering three questions: *1:* What is the histology of the healing primary complex in the intestinal canal? *2:* Does the healed primary complex harbor living tubercle bacilli? *3:* What is the frequency of primary intestinal infections? It was found, in accordance with previous authors, that in intestinal primary infections, healing of the actual portal of entry is so complete that no residua can be found. The lymphatic component of the primary complex is all the more extensive. In all cases (51), the involved lymph nodes were those draining the lower ileum or the caecum. The number of single foci varied between one and thirty, their individual size between that of a millet seed and an almond. With increasing age of the individual, caseated foci decrease in number, and calcified and ossified foci become the rule. The histological characteristics are the same as in pulmonary primary lesions. Search for tubercle bacilli was made in 39 cases, but only histological methods were used. No bacilli were found. Since bacteriological and biological tests, performed by other workers, yielded similarly negative results, it may be assumed that the intestinal primary lesion is much less likely than the pulmonary to cause clinical disease in later life by the process of endogenous lymphatic reinfection. Among 2,500 autopsies, performed in the Virchow Krankenhaus in Berlin, 4 per cent showed the residua of a primary intestinal infection.—*Über die*

Morphologie und Pathogenese des intestinalen tuberkulösen Primäraffekts, M. Iizuka, Beitr. z. Klin. d. Tuberk., May, 1932, lxxx, 79.—(M. P.)

Complications of Mesenteric Tuberculosis.—A young man, 17 years old, was operated on account of what appeared to be acute appendicitis. The appendix was adherent, with its tip showing a tuberculous abscess in the mesenteric lymph nodes slightly to the left from the vertebral column. A second patient, a woman 19 years old, had a normal delivery four months before admission. During the puerperium she developed icterus and pain in the right hypochondrium. A cholecystectomy was performed, and multiple partly calcified lymph nodes were found in the mesentery. Around one of the calcified areas was an abscess-cavity which contained about 300 cc. of pus and calcified material. It is probable that these tuberculous lesions had caused compression and occlusion of the bile duct. A third patient was 55 years old. For the last 10 months she had complained of pains in the upper part of the abdomen. A tumor could be felt in the right epigastrium; it was freely movable and but slightly tender on pressure. At operation a tumor, about the size of an orange, was located between the duodenum and the right kidney. It was a tuberculous abscess. In summary, it is pointed out how a chronic tuberculosis of the mesenteric lymph nodes can produce acute symptoms either by pressure or adhesions.—*Zur Mesenterialdrüsentuberkulose und ihren Komplikationen: Appendicitis acuta und Choledochuskompression, H. Neuer, Beitr. z. Klin. d. Tuberk., August, 1932, lxxx, 523.—(M. P.)*

Hyperplastic Intestinal Tuberculosis.—Intestinal tuberculosis manifests itself in three pathological forms: ulcerative, fibrous and hyperplastic. The ulcerative form is a complication of pulmonary tuberculosis, and occurs in from 60 to 90 per cent of all cases coming to autopsy. The fibrous form is a sequel to the ulcerative type. The hyperplastic variety may be classed under the term tuberculoma since the pathological process is not one of hyperplasia, but of inflammation and infiltration of the bowel-walls. It is with this type of disease that the report deals. The aetiology is difficult to study because, although not as rare as formerly taught, few surgeons have studied more than two or three cases. Whether the infecting microörganism is of the human or bovine type of tubercle bacillus is not known. This form of tuberculosis is usually confined to the large gut. It is rarely associated with active pulmonary tuberculosis. There are three theories regarding the mode of entrance of the infecting microörganism: direct entrance with the intestinal contents, blood-stream infection, and retrograde infection from the mesenteric lymph nodes. The existence of the disease can be determined only after considerable study and can then be inferred rather than positively affirmed. Symptoms are present which may be common also to abdominal tumors, peritonitis, kidney affections and disease of the tubes and ovaries. Usually there has been loss of weight and strength. Constrictive crises or colic may occur, and may or may not be accompanied by vomiting. Moderate constipation with occasional attacks of diarrhoea is common early but there is no uniformity in later symptomatology. Except in the latest stages, the vomiting suggests neither appendicitis nor intestinal obstruction. The differential diagnosis must be made from that of malignant tumor of some abdominal organ. The final diagnosis is made only after microscopic study. Four cases are reported in some detail.—*Tuberculosis of the Large Intestine, G. M. Linthicum, Am. Jour. Surg., June, 1932, xvi, 471.—(J. F. B.)*

Hepatic Insufficiency in Pulmonary Tuberculosis.—Degenerative changes in the liver are frequently found postmortem in cases of pulmonary tuberculosis. A quantitative determination of the galactosuria occurring within 24 hours of the ingestion of 40 gm. of galactose was used as an index of hepatic function. In 77 per cent of those with progressive disease and in 49 per cent of cases presenting relatively quiescent lesions some degree of hepatic insufficiency was demonstrated. A group of patients receiving gold salts therapeutically yielded a similar proportion of positive results, indicating that this form of therapy did not influence hepatic function. Of particular interest was the finding that all patients with gastrointestinal symptoms were shown to have some degree of hepatic dysfunction. —*L'epreuve du galactose au cours de la tuberculose pulmonaire, H. R. Olivier, A. Sliosberg and P. Desnos, Rev. d. l. Tuberc., May, 1932, xiii, 501.—(A. E. M.)*

Genitourinary Tuberculosis.—Tuberculosis of the genitourinary tract is divided into that of the urinary organs, which embrace kidneys, ureters and bladder, and of the genital tract consisting of the prostate, seminal vesicles and testicles. Tuberculosis of the kidney is by far the most common lesion in this system and it is secondary to a primary focus, usually pulmonary or gastro-

intestinal. Involvement of the other urinary and genital organs is usually secondary to that of the kidney. Infection of the urinary tract occurs through the bloodstream from a primary focus and appears early or late in the course of tuberculosis. The clinical picture varies with the location of the lesions in the tract. The diagnosis is accomplished by laboratory study of functional urinary tests, aided by cystoscopy with ureteral catheterization and pyelography. Nephrectomy should always be resorted to as early as possible for an active lesion that is confined to one kidney. Vesical ulceration or more prolonged inflammation require other forms of local treatment such as diathermy and fistulous surgery. Five questions which are the subject of much controversy on the part of authorities require our attention: *1:* The presence of tubercle bacilli in ureteral urine is positive evidence that one or both kidneys have tuberculous lesions. *2:* A tuberculous kidney lesion can heal spontaneously. A mild process, tuberculous or otherwise, can disappear spontaneously. A tuberculous process is less likely to do so than other diseases. *3:* As to nephrectomy in bilateral renal tuberculosis, it is impossible to lay down a standard rule but there are cases in which the more diseased kidney should be removed. *4:* The appearance of the bladder often affords *prima facie* evidence of tuberculosis in the upper urinary or genital tract and persistent study in such circumstances will almost always reveal it. *5:* Local rather than radical operative procedures should be employed in genital tuberculosis, but this course will depend upon the economic situation of the patient.—*Tuberculosis of the Genitourinary Tract, C. H. Chetwood, Am. J. Surg., July, 1932, xvii, 39.*—(*J. F. B.*)

Cortical Suprarenal Extract in Addison's Disease.—A case of Addison's disease is reported. So severe a crisis occurred, that death appeared imminent, but recovery followed the use of cortical suprarenal extract. The first dose was 50 cc. combined with a 5 per cent solution of glucose in physiological salt solution, given intravenously. A rigor followed this dose and the amount was reduced to 10 cc. twice daily for three days, then 10 cc. daily for twenty-three days. The dose since then has been 5 cc. subcutaneously each day. To avoid reactions it is important to inject the solution slowly, in small amounts, and it should be free from adrenalin. Response to cortical hormone is dramatic, but its use must be continued indefinitely in most cases. Glucose and physiological salt solution intravenously is of value to combat dehydration and low blood-pressure. In spite of continued depression of the blood-pressure and the blood sugar level the patient can lead a normal life.—*A Case of Addison's Disease Successfully Treated by Cortical Suprarenal Extract, T. Thompson and B. F. Russell, Lancet, July 23, 1932, ccxxiii, 178.*—(*R. M. F.*)

Cortical Suprarenal Extract in Addison's Disease.—Since March, 1930, when Swingle and Pfiffner described the preparation of an aqueous, adrenalin-free extract of the suprarenal cortex, 20 cases of Addison's disease treated with this extract have been reported in America (Rowntree), and one case in England. Recently a cortical extract has been prepared in England on a commercial scale by a procedure resembling that of Swingle and Pfiffner. In three cases of Addison's disease treated with this preparation the beneficial effects were to a great extent offset by toxic manifestations. Two were definitely improved for a while, but all died rather suddenly. Cases 1 and 3 exhibited disconcerting after-effects, chiefly fever or rigor. A normal subject was given the cortical extract intravenously, and he developed rigor, fever and back-ache, followed by a patchy erythema. In an attempt to elucidate the cause of these phenomena the extract was carefully investigated. Chemical tests failed to reveal the presence of adrenalin; a small trace of protein was definitely present, not amounting to more than 10 mgm. per 100 cc. of the solution. This trace of protein is believed to be the cause of the untoward effects of the preparation, which resembled, on the whole, those seen in protein shock.—*Three Cases of Addison's Disease Treated with an Extract of Suprarenal Cortex, H. W. Benham, M. Fisher, I. More and C. J. L. Thurgar, Lancet, January 16, 1932, ccxxii, 125.*—(*J. S. W.*)

Tuberculin in Addison's Disease.—A case of Addison's disease of advanced type is reported. The patient was given tuberculin (B. E.) injections once a week, beginning with 0.000,01 mgm. This was increased slowly, as there was a reaction with temperature elevation of about one degree after each injection for the first four months. Tabloid adrenalin, 0.003 gm., was given twice daily between meals. Recovery is sufficient to permit normal activities after five months of treatment.—*A Case of Addison's Disease, W. Broadbent, Lancet, July 23, 1932, ccxxiii, 184.*—(*R. M. F.*)

Tuberculosis of Vertebral Body.—One hundred cases of spinal tuberculosis were

studied and an attempt was made to correlate the clinical knowledge and the gross pathological picture with the evidence afforded by the roentgenogram. Roentgenologically, tuberculous involvement of the vertebrae is classified as follows: (1) central type; (2) intervertebral articular type; and (3) anterior type. In the central type the infection comes through a branch of the posterior spinal artery and involves, first, the central portion of the body of the vertebra. The area of destruction gradually enlarges until most of the vertebral body is involved and then, because of the transmitted pressure upon it, the body collapses with the appearance of the characteristic kyphosis. As the area of destruction spreads through the body of the vertebra the epiphyseal portion becomes involved, with consequent destruction of the intervertebral disc. The tuberculous process then spreads to the adjacent vertebra, either by involving the contiguous portion of the articular surface of the body, or it spreads beneath the anterior longitudinal ligament and involves the anterior portion of the body and later the central portion. This is the most frequent type found in children and all cases in this series under twelve years of age were of the central type, and all but 4 under twenty were of the central type. The central type of lesion did not show a predilection for any region, but was well distributed throughout the spine. In cases with central type of involvement, there may be few symptoms in the early stages of the disease. It was usually after collapse of the vertebra had taken place that these cases were seen, and this absence of early symptoms may be the reason why 86 per cent of the central type in this series showed collapse of the affected vertebrae. *Intervertebral articular type:* The articular margins of the vertebrae are supplied by the epiphyseal arteries, which are branches of the posterior spinal artery, and it is through these arteries that the infection takes place. In this type the infection begins along the articular margins of the body of the vertebrae and consequently there is early involvement and destruction of the intervertebral disc. Narrowing of the disc is one of the earliest roentgenological signs in this type. There is also early involvement of the adjoining vertebral articular surface. Abscess is also commonly found early in the course of the disease. Symptoms usually occur while the disease is still in its early stages and therefore many more early cases of this type than of the central type are found. As the disease progresses, there is gradual excavation from the articular surface toward the central portion of the body of the vertebra. The destruction may also extend to the anterior portion of the vertebrae and, when this point is reached, there is generally collapse of the body of the vertebra as was noted in the central type. In this series only 10 per cent of the cases with this type of infection showed collapse. *Anterior type:* The anterior portion of the body of the vertebrae is supplied by the branches of the intercostal arteries entering through the anterior longitudinal ligament. The infection spreads along the surface beneath the anterior longitudinal ligament and tends to remain superficial, but may involve a number of vertebrae, however, and it then resembles the central type with destruction and collapse of the vertebral body. The age-incidence in this series was twenty-nine years. The mode of infection is by the haematogenous route but the lymphogenous route may also play a part. Abscess is the most common complication and was found in 84 per cent of the cases in this series at some stage of the disease.—*The Roentgen Signs of Tuberculosis of the Vertebral Body, H. P. Daub and C. E. Badgley, Am. J. Roentgenol. & Rad. Ther., June, 1932, xxvii, 827.*—(*W. I. W.*)

Tuberculosis of Trochanteric Region.—Bone infection near a joint occurs almost always before the eighteenth year and most frequently in children from five to twelve years of age. Tuberculosis is the most common infection. The joint is protected from infection by the epiphyseal discs. Early symptoms vary a great deal and are not characteristic. Conservative treatment is urged, and operation is employed early only when the disease is definitely localized. The case reported is that of a girl eight years old, who gave a history of treatment for tuberculosis of the hip over a period of nearly three years. Roentgenograms showed a lesion in the upper end of the femur. At operation a bone-cavity containing two sequestra and a quantity of pus were found. Tubercle bacilli and *Staphylococcus aureus* were recovered from the pus. Drainage of the abscess and immobilization of the hip resulted in cure.—*An Unusual Case of Tuberculosis of the Trochanteric Region, D. W. Hauser, Am. J. Surg., March, 1932, xv, 551.*—(*J. F. B.*)

Tubercle Bacilli in Blood in Tuberculosis of Bones.—The blood was cultured according to Löwenstein's method in 67 patients with tuberculosis of the bones and in 39 controls without tuberculosis. Of the former, 26 specimens yielded tubercle bacilli colonies, while the controls all re-

mained negative. These studies were made in Löwenstein's laboratory.—*Über die Züchtung der Tuberkelbacillen aus dem Blute nach Löwenstein bei Knochentuberkulose, A. Urgoiti, Beitr. z. Klin. d. Tuberk., August, 1932, lxxx, 480.*—(*M. P.*)

Epicutaneous Tuberculin Reaction in Skin Tuberculosis.—The local reaction in the commonly used tuberculin tests has been explained by the partial decomposition of the bacillary protein, which, depending on the mode of administration, is absorbed more or less rapidly by the blood- or lymph-stream. Attempts have repeatedly been made to demonstrate the absorption of the antigen through the intact superficial layers of the skin, but only recently Nathan, using the pad method, which has been introduced by Jadasohn and Bloch, has published his results in 120 cases of skin tuberculosis with the epicutaneous application of tuberculin. Nathan's observations suggest that a strictly epithelial hypersensitiveness may exist and that the epicutaneous test is positive only in tuberculosis of the skin and negative in all other cases with or without active tuberculosis in other organs. Schmidt in his report of 74 cases, while confirming some of Nathan's findings, gathered, however, the impression that the epidermal test is neither specific for tuberculosis of the skin nor sufficiently sensitive to be of value for differential diagnosis. Schmidt used Old Tuberculin solutions of 10, 25 and 50 per cent on pads, 2 x 2 cm., which were applied to the unroughened skin, covered with oilskin and fastened for 24 hours with adhesive. The height of the reactions, which were read in 24-hour intervals, was reached, in the majority of cases, on the 3rd or 4th day. Four types of reactions are described, depending on the number and distribution of vesicles and the appearance of erythema or other more pronounced inflammatory signs. Much weaker tuberculin solutions were employed when the test was made on the roughened skin, because the sensitiveness appeared to be markedly increased if the *stratum corneum* had been removed with fine sand-paper. The test on the roughened skin resembles, in the author's opinion, the intracutaneous method, because after the removal of the superficial layers the antigen is more easily absorbed by the lymph-stream, even if there is no direct contact with the capillaries. Of the 26 cases of lupus in which the epicutaneous test was made 5 did not react to the strongest solution and two gave a very weak reaction to the 50 per cent tuberculin. On the other hand, of the 45 patients without skin lesions, 10 showed a positive reaction, and it is pointed out for this reason that the percentage of negative reactions in skin tuberculosis and of positive reactors with tuberculosis of other organs is much too high for a specific test. As the antigen was applied to the roughened skin more marked reactions with occasional failures were observed. A tabulation of the reactions obtained by this technique and by the Pirquet tests which were made simultaneously, suggests very strongly a similarity of both tests, while the epidermal tests on the unroughened skin bears a resemblance to Moro's tuberculin ointment tests. The author concludes that there is no principal difference between the various tuberculin tests and points out that his results with the epicutaneous tests have so far failed to substantiate Nathan's claim that the epidermal test is specific for tuberculosis of the skin—*Epicutane Ueberempfindlichkeitsreaktionen bei Hauttuberkuloesen, P. W. Schmidt, Klin. Wchnschr., July 9, 1932, xxviii, 1178.*—(*K. F.*)

Differentiation of Branchial Cysts and Tuberculous Abscesses.—The physical signs of a branchial cyst and a tuberculous abscess are practically identical. The material aspirated from each is indistinguishable macroscopically. Tubercle bacilli are found in the material aspirated from a tuberculous abscess in less than 10 per cent of cases. The author found tubercle bacilli in the aspirated material from a branchial cyst before operation and in the contents of the sac after operation. Certain criteria for differentiation are suggested, as follows: (1) cysts are rare, while abscesses are common; (2) cysts appear between seventeen and twenty-five years of age, rarely before puberty; (3) if the sternomastoid is made tense by the patient, it will be found thinned over the cyst, but unaltered over an abscess; (4) immediate microscopical examination of aspirated fluid reveals cholesterol crystals in case of a cyst. Therapeutic aspirations, injection of drugs, and inflammation may destroy these crystals. During the past seven years 30 operations for the excision of a tuberculous abscess associated with tuberculous nodes have revealed a branchial cyst instead of an abscess in 3 cases. The cyst can be completely enucleated. It is suggested that those who treat abscesses by aspiration and injection use lipiodol and obtain diagnostic information by roentgenograms.—*On the Similarity of Certain Tuberculous Cervical Abscesses and Branchial Cysts, H. Bailey, Brit. J. Tuberc., October, 1931 xxv. 167.*—(*R. M. F.*)

Scrofulosis and Parallergy.—Certain tuberculin-positive individuals react to ordinary broth and to peptone. This nonspecific hypersensitiveness has been termed *parallergy*. Moro and Keller believe that scrofulosis, erythema nodosum, certain pulmonary infiltrations and phlyctenules are conditioned by parallergy. Twelve children with typical and severe scrofulosis, and 16 children who developed phlyctenules were tested for parallergy; 7 of the former group and 5 of the latter reacted only to tuberculin but not to broth. Parallergy, as such, can therefore not be accused as the causative condition for the disease mentioned.—*Skrofulose und Parallergie, H. Fernbach and M. Weichsel, Beitr. z. Klin. d. Tuberk., September, 1932, lxxx, 675.*—(*M. P.*)

Treatment of Tuberculosis.—Tradition, experience and scientific methods have served as guides in the treatment of tuberculosis. Galen's views held sway for many centuries. Reliance was placed upon purging, the application of plasters to the chest, astringents, and, less often, on sedatives. Laennec contributed the stethoscope and the possibility of earlier diagnosis. Bodington, followed by Henry MacCormac and Niemeyer, urged the value of fresh air. Koch revealed the tubercle bacillus. Modern therapy relies on fresh air, nourishing food and rest, with emphasis on rest. Certain remedial agents produce focal reactions and a degree of "splinting" or focal rest. The use of such agents as tuberculin or sanocrysin requires control, and this may be provided by observing the sedimentation rate or the leucocytic changes, especially those of the monocytes. These scientific methods are of importance in prognosis and as guides to treatment.—*Practice and Principle in the Treatment of Tuberculosis, A. Trimble, Brit. J. Tuberc., January, 1932, xxvi, 15.*—(*R. D.*)

Treatment of Pulmonary Tuberculosis.—The fact that two-thirds of the sanatorium admissions are far advanced emphasizes the need for early diagnosis, which may be secured more often as the laity's attitude toward tuberculosis is changed. For the general practitioner, stress is laid on the necessity of suspecting a persistent cough, of treating the patient as tuberculous if the diagnosis is in doubt, of repeating negative sputum examinations, of observing both temperature and pulse, and of taking a stereoscopic X-ray in addition to doing a thorough physical examination. The routine of examining a patient in the sanatorium is outlined, and in addition to the more generally accepted measures emphasis is laid on the value of observing the sedimentation rate. In connection with the sputum examinations, mention is made of the value of the new methods of culturing tubercle bacilli. Treatment by sanocrysin is recommended for advanced cases. Of the cases with extensive trouble but no cavities 93.75 per cent are alive and 69 per cent are actually at work. The great value of artificial pneumothorax is emphasized and, in connection with the complicating effusions, aspiration is recommended with the introduction of methylene-blue, acriflavine, or alepol. Mobile mediastinum and adhesions demand special methods of treatment such as oleothorax and cauterization, respectively. Patients with pneumothorax may return to the general practitioner's care, in which case the possibility of an effusion or of a spontaneous pneumothorax is to be kept in mind. An effusion must not be neglected. Pneumothorax failures are most often to be attributed to adhesions and the seriousness of this failure is indicated by the statement that only 9 per cent of these patients are at work as compared with 46 per cent of those with a good collapse. A phrenic evulsion is done on the pneumothorax side as a routine, unless it has been necessary to perform it on the opposite side. Phrenic evulsion is used in almost any case with extensive trouble and has affected 57 per cent of cavities as against 12 per cent treated by sanatorium routine. Thoracoplasty is recommended for a limited group of cases, 38 per cent of those undergoing the operation being cured. It is felt that in England too few physicians recommend the operation and too few surgeons perform it.—*Practical Points in Diagnosis and Routine Treatment of Pulmonary Tuberculosis, P. W. Edwards, Lancet, April 2, 1932, ccxxii, 709.*—(*R. D.*)

Progress in Treatment.—The most important therapeutic progress in pulmonary tuberculosis during the last 50 years came with the introduction of artificial pneumothorax. Recently bilateral pneumothorax is being much more frequently used. As an adjuvant or substitute to pneumothorax, thoracoplasty is more and more employed. The roentgen-ray treatment has only a small number of advocates. But in most of the cases of pulmonary tuberculosis we are restricted to conservative means purporting to raise the resistance of the body and to strengthen the constitution. Air, light, sun, food and exercise, as prophylactic or therapeutic agents, must come in for consideration. The dietetic regimen of old plays a rôle, but the Sauerbruch diet

of to-day is still an object of controversy. The hygienic-climatic therapy is part of the scheme of treatment in most sanatoria. The coöperation between the Board of Health and the sanatorium is highly important.—*Die Therapie der Lungentuberkulose in den letzten 50 Jahren, R. Staehelin, Deutsche med. Wchnschr., May 20, 1932, lviii, 806.*—(*H. S. W.*)

Care of Advanced Tuberculosis.—The case discussed in this paper is the one which is unlikely to receive benefit from any form of treatment. In this type it is uneconomical to provide prolonged sanatorium treatment which is mainly of educational value. Advanced cases must not be allowed to occupy beds needed for those who have a prospect of decided and permanent benefit by treatment. Except when there are young children present and there is overcrowding, the educated advanced case can return home with little risk of spreading the infection to others. Unless there is definite contraindication on hygienic grounds, sentimental factors should be considered in all advanced cases. Whenever possible those that are ambulant should be given light employment with some small remuneration. When home conditions are bad the ambulant advanced case should be retained at a country home as long as his physical condition allows, and then transferred to an institution as near his home as possible.—*The Problem of the Advanced Tuberculous Patient, F. Heaf, Brit. J. Tuberc., October, 1932, xxvi, 190.*—(*E. H. K.*)

Mind and Tuberculosis.—In the treatment of tuberculosis, healthy living is all important, other remedies being no more than adjuvants, and in themselves useless to stay the progress of the disease if the mode of living is unhealthful. Since the course of the illness is invariably long, much depends on the condition of the patient's mind, which must be such as would enable him to make a consistent effort toward recovery. It seems at first sight that there should be no great difficulty in carrying out so simple a regimen as that described in the dictum, rest, fresh air, and good food; none the less it is common knowledge that many people with tuberculosis have not the endurance to carry out this mode of life for a sufficient period, and a large proportion of them throw away their lives as the result of this failure to adapt themselves to a suitable environment. If the tuberculosis physician could learn so to influence the minds of his patients that they acquired a proper attitude toward the disease, the greatest therapeutic advance of the century would have been achieved. The resistance to tuberculosis may be lowered by psychic trauma; illness is likely to follow when all desire for life and health have gone. The reaction to the diagnosis may be incredulity, and often includes anticipation of early and complete cure. Once under treatment, the patient who shows adaptability has a correspondingly improved prospect of recovery. Readjustment and guidance are necessary for many. A patient who is unduly anxious and falls into needlessly meticulous routine may be helped by persuasion or a change of circumstances in which dependence on himself will be more necessary. The patient who overcompensates by feats of prowess or a disguising of symptoms may be helped if an insight into his own condition is given. The attitude which seeks to avoid the unpleasant by disregarding symptoms of recurrence must be guarded against. The patient with a hopeless prognosis appears to delude himself as to the outlook; sometimes his effort is fairly successful but in other cases it is no more than a pitiful attempt at self-deception. It is in the mental aspect of tuberculosis that the difference between home and sanatorium treatment is important. In the home the patient is constantly being reminded of his illness; overanxiety on the part of the family may worry him unduly; or he may not be able to bring himself to accept care from those whom he regards as elderly or infirm. The occasional patient who cannot settle down to sanatorium treatment may be better off at home despite the handicaps. Finally, tuberculosis is the one condition in which it is most essential to treat the patient rather than the disease.—*The Mind in Tubercle, A. Morland, Lancet, January 23, 1932, ccxxii, 176.*—(*R. D.*)

Alpine Climate in Treatment of Tuberculosis.—The more usual objections to the Alpine climate in the treatment of pulmonary tuberculosis are (1) that an adverse effect is produced on active tuberculosis, and (2) that a patient should cure in the country in which he must live. Patients who do not do well in the mountains are unlikely to do well at lower levels. Arrest of the disease in one climate cannot be shown to be less permanent than that obtained in another. Reports that tuberculosis is endemic in Switzerland and that it may be contracted at a sun station are not strictly true. The antituberculosis campaign has not been of long duration. The death-rate is higher in Switzerland than in England and the Irish Free State but lower than in Scotland. Study of the natives of Arosa, where a sun-bath station is located,

shows the mortality to be but one-half that of the general population of Switzerland. Some of the advantages of Alpine treatment are (1) the stimulus to metabolism, (2) the climatic variability, (3) the higher degree of insolation and relatively low humidity, (4) the psychological benefits of the beautiful environment and abundant sunshine, (5) the rapid disappearance of secondary microörganisms in the majority of cases of open tuberculosis, and (6) the vast store of evidence of benefit to nonpulmonary tuberculosis. Acute and far advanced cases should not be sent on long journeys. Patients without the financial means required for board, lodging and care should remain at home. Of vital importance are regulated rest and exercise, proper food and open-air life, and suitable climate environment to make the patients' readjustments easier and more enjoyable.—*Mountain Climates and the Treatment of Tuberculosis, H. Roche, J. State Med., February, 1932, xl, 106.*—(*J. F. B.*)

Tuberculosis Dispensary.—More than 400 tuberculosis dispensaries, which are essentially consultation centres for general practitioners, are operating in the British Isles. Fifty per cent of all cases sent to dispensaries for diagnosis are nontuberculous. These centres should be designated as "chest clinics" and should be reorganized so as to afford ample opportunities for study of chest diseases by general practitioners and medical students.—*The Need for the Reorganization of the Tubeculosis Dispensary, P. Ellman, Brit. J. Tuberc., July, 1931, xxv, 115.*—(*R. M. F.*)

Tuberculosis Colony.—The usual tuberculosis scheme lacks adequate provision for after-care. This can be provided properly in a tuberculosis colony, which should consist of a sanatorium, an industrial department and a settlement. The sanatorium is of particular value for preventing relapses in settlement workers by providing short periods of intensive treatment. The security of tenure of his job promotes the well-being of a settler employed in a colony. The constant medical supervision of the man and his family in his home and work is of inestimable value in the prevention of relapses. The settlement serves as a testing ground to determine fitness for return to former work. The healthiness of settlers' children is a prominent feature in Papworth, Preston Hall, and Barrowmore. Some of the money expended on tuberculosis schemes might be used advantageously to place the tuberculous population in recognized settlements.—*The Place of the Tuberculosis Colony in a Complete Tuberculosis Scheme, E. L. Sandiland, Brit. J. Tuberc., July, 1931, xxv, 122.*—(*R. M. F.*)

Tuberculosis Settlements.—The practicability of village settlements, such as that at Papworth, is emphasized. It is shown that early cases can be obtained and that the protected family life of individuals suffering from moderately advanced and advanced tuberculosis in such a village is more profitable than other solutions to these problems. Such settlements are not expensive. While they are not self-sustaining they save far more than they cost. Village settlements are necessities.—*Tuberculosis Settlements, P. Varrier-Jones, J. State Med., September, 1932, xl, 536.*—(*J. F. B.*)

Post-Sanatorium Care in Venice.—Following the same plan adopted by the British in establishing their industrial colony in conjunction with a sanatorium in order to quickly rehabilitate and to make their cured patients self-supporting, the municipal hospital of Venice has instituted a similar department. The amount and character of the work to be done is carefully chosen to fit the physical condition of the patient. The plan may be carried further by making it possible for individuals cured of tuberculosis to be reëmployed in the same shops or factories that they worked in at the time of onset of the disease. For the arrested cases, institutions operated in conjunction with tuberculosis dispensaries will allow careful medical supervision of the workers. A colony with graded occupational therapy may be formed for the chronic cases with no chance for complete recovery. —*La cura di lavoro nell'assistenza post sanatoriale dei tubercolotici: laboratori dispensariali, D. Canzio, Tubercolosi, May, 1932, xxiv, 145.*—(*U. E. Z.*)

Surgical Treatment of Nonpulmonary Tuberculosis.—To the surgeon the discovery of the tubercle bacillus revealed the tuberculous nature of a number of diseases which up to that time had not been suspected of having such origin. To this group belong certain cases of tuberculous articular rheumatism, lupus vulgaris, scrofuloderma, the tuberculous rectal fistula, genitourinary tuberculosis, tuberculosis of the serous membranes, and so on. Dependable differential diagnosis of a number of clinically similar diseases, as, for instance, infectious arthritis, syphilis of the joints and other organs, certain forms of actinomycosis and even tumors, became possible. Differentiation of the human and bovine types of the tubercle bacillus decides often

the prognosis and treatment. Tuberculin is especially helpful in diagnosis and has a therapeutic value also. Primary tuberculosis of the skeletal system is very rare. It is to be regretted that the diagnosis of tuberculosis of the bones or joints is still made mainly by the clinical picture and the X-ray. Tuberculin and biopsy should be more often used. At the time and immediately following the discovery of the tubercle bacillus, radical surgical removal—by knife, saw, cautery and spoon—of the tuberculous tissue and organs, especially that of the bones and joints, was the usual procedure. Tuberculosis of the genitourinary organs, of the intestinal tract, of the mesenteric lymph nodes was a field for surgery. Results were often good, and often bad, and soon led to conservative therapy. But a definite line of attack is still present today. A pioneer of the conservative treatment was Bier who advocated hyperaemia as a mode of treatment. Bernhard and Rollier were the standard-bearers of heliotherapy. Also X-rays were included in the armamentarium. Fixation of tuberculous joints in plaster casts proved of lasting value through ankylosis. Later, importance was put on functional results. There was a bitter controversy between the exponents of surgical and conservative treatment, and each had its failures and successes. A better knowledge of the so called stages of tuberculosis (Ranke) would have obviated this apparently chaotic condition. On the one hand, in the second stage (of generalization and metastasis) with a heightened allergy and a tendency to exudation, an early operation was performed, whereas in the third stage with an increased immunity, with destructive lesions and mixed infections, a conservative attitude was taken. In selected cases of old tuberculosis of the bones and joints, certain cases of genitourinary and intestinal tuberculosis, good results may be obtained by operative procedures. Surgery came again to the foreground; it proved less costly and time consuming, but individualization was stressed. Enthusiasm for exclusive light and ray treatment faded. The dietary treatment was inaugurated by Herrmannsdorfer and doubtless has value. More recently the orthopaedists recommended an operative fixation of tuberculous joints by bone-grafting, as, for instance, in the Albee operation.—*Über den Einfluss der Tuberkuloselehre R. Koch's auf die Chirurgie. Eine pathologisch-biologische Betrachtung, E. Payr, Deutsche med. Wchnschr., March 25, 1932, 481.*—(*H. S. W.*)

Surgical Treatment of Pulmonary Tuberculosis.—It remains for the profession at large to accept surgical procedures in the treatment of pulmonary tuberculosis. These have been perfected to the degree that at present between 80 and 90 per cent of the estimated 40,000 tuberculosis patients can be expected to be benefited by their employment. Surgery for pulmonary tuberculosis has passed through many phases, a brief review of which shows that the present satisfactory state is a result of numerous combinations of procedures. Rest is the keystone of successful treatment of tuberculosis. Various methods for securing physiological rest are employed. Phrenic-nerve evulsion is indicated for failure of artificial pneumothorax; as a preliminary to thoracoplasty; to relax adhesions which prevent collapse by pneumothorax; to lengthen the time between refills in otherwise satisfactory pneumothorax therapy; and in early cases. Extrapleural pneumothorax and intrapleural pneumolysis are valuable procedures. The latter method is greatly restricted by a number of contraindications such as difficult technical manoeuvres, the location of adhesions, subsequent haemorrhage, and infection with empyema. The operation of choice is that of extrapleural paravertebral thoracoplasty. The contraindications are cardiovascular disease, severe laryngeal tuberculosis, severe kidney disease, and intestinal tuberculosis. Few patients over forty-five years of age are suitable. The procedure is performed under local anaesthesia. A two-stage operation is preferred. At the first stage the sixth to eleventh ribs are removed. After a two or three weeks' interval there follows a resection of the fifth, third, second, first and fourth ribs in order. Postoperative complications which may occur are shock, mediastinal shifting, paradoxical respiration, haemorrhage, cough and retained secretions, massive collapse of the opposite lung, and infection. Details concerning a patient upon whom a satisfactory result from thoracoplasty was obtained are given.—*Surgical Treatment of Pulmonary Tuberculosis, A. W. Hoaglund, Am. Jour. Surg., April, 1932, xvi, 68.*—(*J. F. B.*)

Surgery of Pulmonary Tuberculosis.—This is a report of 135 patients, treated by surgical methods on account of pulmonary tuberculosis. They were all operated on by Prof. Ranzi in Vienna from 1919 to 1924 and in Innsbruck from 1924 to 1931. Thoracoplasty was done in 80 (66 complete and 14 partial), tamponing in 23, and phrenicectomy in 32. Thoracoplasty was performed with the usual indications, in two or three stages, and usually under local anaesthesia. The term "healed" denotes patients who are able to work normally

without any morbid symptoms and who have negative sputum, if any; the observation period must be at least one year after operation. The group "improved" consists of patients who can do part time work, whose process is arrested, but who may, at times, have bacilli in the sputum. The mortality within the first week of the operation was 2.5 per cent, within the first two months, 11.2 per cent, while an additional 36.3 per cent died later. The healed were 26.3 and the improved 15.0 per cent. In analyzing the material further, it becomes evident that cirrhotic processes yield considerably better results, and that operations on the left side are more favorable. The condition of the contralateral lung is one of the most significant factors in the indications; phrenicectomy was found to be not a reliable test for the ability of the contralateral lung to carry the additional burden after thoracoplasty, clinical and roentgenological observations being more dependable in this regard. Extension of the tuberculous process in the contralateral lung was with 15 cases the most frequent cause of death, while circulatory failure caused death in 4 patients. Tamponing was done with paraffine. The results were little encouraging. Phrenicectomy was performed for a variety of indications, some as independent operations, some as auxiliary procedures in conjunction with other operations. Of 32 patients operated, 9 are healed, 4 improved and 14 dead. In the second half of this paper, the physical signs over collapsed lungs are discussed in detail. It is claimed that physical examination permits to differentiate between progressive and arrested lesions, even following complete thoracoplasties.—*Beitrag zur chirurgischen Kollapstherapie bei Lungentuberkulose, P. Huber and C. Waitz, Beitr. z. Klin. d. Tuberk., June, 1932, lxxx, 139.*—(*M. P.*)

Principles of Pulmonary Collapse.—Collapse of a tuberculous lung benefits the patient through both the mechanical and the physiological effects it produces. The mechanical effect is striking. Cavities shrink and close and the formation of connective tissue is accelerated. In uncollapsed lungs these processes can take place only to a limited degree in the same time. Physiologically the essential effect is upon the blood circulation in the pulmonary system in distinction to the bronchial system, which provides for lung nourishment. The rate of blood-flow is reduced and a certain stagnation results in the pulmonary system. This is not true of the bronchial system, for the oxygen content is unchanged. The latter would be impossible if the collapsed lung received more blood and the sound lung less. Conditions which produce collapse (rather than compression) of the lung, with no displacement of the heart or mediastinum, bring no difficulty to the patient either immediately or in the course of years. Relief from symptoms, such as disappearance of fever, increased appetite, the approach of normal cardiac activity and gain in weight, is due to the factors which promote healing. The first effect is blocking of the lymph circulation and the prevention of lymph, loaded with poisonous products, from pouring easily into the general circulation. The accumulating toxins exercise a marked reaction in the lung. They stimulate connective-tissue growth. They cause a purification of cavities and demarcation of the diseased from the healthy tissue. Tubercle bacilli are injured by the damming up of their own products of metabolism. The stagnation of lymph furnishes the most reasonable explanation of the healing effect by pulmonary collapse. These principles have been studied and proved in cases collapsed by pneumothorax, but they hold equally in other forms of collapse. Thoracoplastic operations are employed when there are adhesions between the lungs and the thoracic wall which prevent adequate pneumothorax. Paralysis of the diaphragm is accomplished by phrenicectomy. The application of paraffin to limited portions of the lungs may bring about collapse. Above all, study has resulted in the application of extensive extrapleural thoracoplastic operations, which stand clearly in the foreground. This procedure can be so shaped and carried through that it gives the full range of effect of a good pneumothorax.—*The Scientific Principles of Lung Collapse Therapy, L. Brauer, J. State Med., February, 1932, xl, 113.*—(*J. F. B.*)

Lung Collapse Therapy.—There are five methods of obtaining lung collapse, each attaining its object either by passive collapse or by active compression. In some a foreign substance is used, but in others the collapse depends on alterations of the surrounding walls. As a general rule passive collapse is to be preferred to compression, and the permanent introduction of foreign substances is to be avoided. *Pneumothorax* in the absence of adhesions requires no compression; when compression is required the risks are increased. *Oleothorax* produces compression by virtue of the weight of the oil if nothing else. The procedure is relatively safe in the presence of a mobile mediastinum. The hazard of

perforation is much greater when the mediastinum is fixed. *Phrenicectomy* or *phrenic evulsion* performed by a surgeon is in a class by itself, as it is practically devoid of risks or complications. The effect is one of passive collapse. Fibrotic lesions, in contradistinction to exudative lesions, respond to this operation. *Thoracoplasty* again provides passive collapse. In selected cases the operative mortality should not exceed 3–10 per cent and there is little hazard of future complications. A limited operation is advocated for apical disease. Phrenicectomy is opposed in conjunction with total thoracoplasty. *Extrapleural pneumolysis* is less satisfactory than an efficient thoracoplasty, but may be of service where thoracoplasty is not justified on account of the patient's age or disease in the opposite lung.—*Lung Collapse Therapy, H. M. Davies, Lancet, August 6, 1932, ccxxiii, 274.*—(*R. D.*)

Artificial Pneumothorax.—During a period of 7 years, treatment by pneumothorax was attempted in 200 cases at Winsley Sanatorium. Of these 7 per cent were class 1, 53 per cent where class 2, and 40 per cent were class 3. Induction was successful in 166, or 83 per cent, of whom 94, or 57 per cent, are alive; it was unsuccessful in 34, of whom 38 per cent are alive. On discharge 46 had no sputum or were sputum-negative for tubercle bacilli. Of these 65 per cent are alive. Analysis of the table giving the time intervals involved shows that of 101 cases treated 2 or more years ago there were 88 successes, with 30 living, and 13 failures with 1 living. As the pneumothorax was utilized only after routine sanatorium treatment had failed to effect improvement the results are allowed to speak for themselves. Even if in some cases the results are not permanent as yet, to use the words of Riviere, the prolongation of life, increased comfort and well-being, and return of power to work, and this for the most part among cases of advanced disease, entitles the operation of pneumothorax to a very high place among successful therapeutic measures.—*Artificial Pneumothorax, J. D. Macfie and A. J. P. Alexander, Lancet, February 27, 1932, ccxxii, 450.*—(*R. D.*)

Artificial Pneumothorax.—Fifty-five patients were treated by pneumothorax in a clinic at Victoria Park Hospital during 1931. Of these 34 were working or fit to work. Sputum was absent or free from tubercle bacilli in 45. A serous effusion occurred in 18, while a tuberculous purulent effusion was present in 2 cases. During the year 9 patients were admitted to hospitals or sanatoria, in 3 cases for division of adhesions, in 4 cases as an accessory to treatment, and in 2 because the condition was becoming worse. Pneumothorax was discontinued in 17 cases for the following reasons: optional reëxpansion in 8, fluid in 4, extension of the disease to the other lung in 4, and because of interference with the circulation in one.—*Artificial Pneumothorax, Some Results of Out-Patient Treatment, V. S. Hodson and R. S. Johnson, Lancet, October 8, 1932, ccxxiii, 787.*—(*R. D.*)

Artificial Pneumothorax.—Records are presented of 16 cases in which artificial pneumothorax was used. They represent a group of unusual cases which emphasize the difficulties which may be encountered with the procedure. Four main groups of "accidents" are mentioned: (1) pleural or pleurocardial reflex, (2) gas embolism, (3) dislocation of the mediastinum following the use of excessive quantities of gas, and (4) pulmonary oedema or congestion. Fibrosis in the treated lung is almost always present. Comment is made on the fact that the combination of joint tuberculosis and cavity was seldom encountered, while infection of the testes or ovaries was quite frequently associated with cavities in the lung.—*Twenty Years' Experience of Artificial Pneumothorax, H. De C. Woodcock, Lancet, October 1, 1932, ccxxiii, 726.*—(*R. D.*)

Modern Artificial Pneumothorax.—Artificial pneumothorax has become more and more established as a successful method of treatment in pulmonary tuberculosis. A large number of practitioners know little about it and regard it as a drastic procedure, while patients in sanatoria discuss it and even ask for it. Formerly large refills of 1,200 cc. or more were used, but these were often attended by reactions. Smaller refills at more frequent intervals are now preferred, and the best results are secured when the lung is about two-thirds collapsed. Small selective collapses are difficult to handle. They may be necessary when bilateral pneumothorax is used. Experience with this form of treatment has been disappointing, although occasionally a remarkable success follows. Adhesions may be cauterized. Oleothorax, or gelatinothorax (Hunter), may be used to keep the lung collapsed and to prevent the extension of adherent pleuritis, but pneumothorax is a preferable procedure. Phrenic evulsion may be used in cases with mobile mediastinum, or as a routine when refills are discontinued and reëxpansion is desired. Tuberculous pyopneumothorax is treated by washing the

pleural cavity with Dakin's solution and trying to make the lung reëxpand. If the space persists, thoracoplasty is indicated. The presence of secondary organisms implies a ruptured lung and a grave outlook. The duration of treatment in a straightforward case should be about 3 years. These patients are able to work, one of the indications for artificial pneumothorax being the inability of the patient to give sufficient time to sanatorium or other treatment which will keep him away from his work.—*The Modern Conception of Artificial Pneumothorax in the Treatment of Pulmonary Tuberculosis, L. S. T. Burrell, Brit. J. Tuberc., January, 1932, xxvi, 28.*—(*R. D.*)

Artificial Pneumothorax in Bilateral Pulmonary Tuberculosis.—In bilateral pulmonary tuberculosis monolateral artificial pneumothorax led to definite improvement in the contralateral lung, making the institution of pneumothorax on the contralateral side superfluous. In explanation the author offers the "detoxication" idea, as well as that of an increase in pressure on the contralateral side with a shift of the mediastinum. Pressure measurements on both pleural spaces indicated an increase in pressure in the contralateral pleural space following monolateral pneumothorax. The author advises hesitating in the use of bilateral pneumothorax in bilateral cases. The pneumothorax is instituted on the most active side.—*Über die Wirkung des einseitigen künstlichen Pneumothorax bei doppelseitiger Lungentuberkulose. Pneumothoraxstudien. V. Tl., E. Schill, Beitr. z. Klin. d. Tuberk., 1931, lxxvi, 633.*—(*H. J. C.*)

Bilateral Artificial Pneumothorax.—A new infection or a tuberculous reinfection in the contralateral lung occurring during the course of an artificial pneumothorax is a very grave complication and of serious prognostic significance in most cases. If the new lesion is of the slowly progressing type and not accompanied by severe constitutional symptoms, bilateral pneumothorax may be instituted. Six cases are reported with good results.—*Collassoterapia successivamente bilaterale, Considerazioni-Casi clinici, M. Ardizzone, Tubercolosi, March, 1932, xxiv, 73.*—(*U. E. Z.*)

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